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USING SUBSECTOR ANALYSIS TO ASSESS THE IMPACT OF POLICY REFORM ON COMMODITY SUBSECTORS

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LIST OF ACRONYMS

ACC	Agricultural Commodity Council
ACs	Affiliated Companies
ACDI	Agricultural Cooperative Development International
ALCOTEXA	Alexandria Cotton Exporters Association
APCP	Agricultural Production and Credit Project
APRP	Agricultural Policy Reform Program
ARC	Agricultural Research Center
BOT	Build, Operate, Transfer
CAH	Central Administration for Horticulture
CAPQ	Central Administration for Plant Quarantine
CASC	Central Administration for Seed Certification
CASP	Central Administration for Seed Production
CATGO	Cotton Arbitration and Testing General Organization
CBE	Central Bank of Egypt
CRI	Cotton Research Institute
CSPP	Cotton Sector Promotion Program
EAO	Egyptian Agricultural Organization
FSRP	Food Security Research Program
GOE	Government of Egypt
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HC	Holding Company
HEIA	Horticulture Export Improvement Association
HSU	Horticultural Services Unit
IAS	Irrigation Advisory Service
IFPRI	International Food Policy Research Institute
IPM	Integrated Pest Management
MALR	Ministry of Agriculture and Land Reclamation
MD	Managing Director
MPE	Ministry of Public Enterprise
MEFT	former Ministry of Economy and Foreign Trade (former name of MFT)
MFT	Ministry of Foreign Trade
MPWWR	former Ministry of Public Works and Water Resources (former name of MWRI)
MSHT	Ministry of Supply and Home Trade
MTS	former Ministry of Trade and Supply
MVE	Monitoring, Verification and Evaluation Unit
MWRI	Ministry of Water Resources and Irrigation
PBDAC	Principal Bank for Development and Agricultural Credit
PPC	Program Planning Committee
RDI	Reform Design and Implementation Unit
STTA	Short Term Technical Assistance
USAID	United States Agency for International Development

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The MVE Unit alone is responsible for any errors and omissions. The findings and conclusions of this study are those of the MVE Unit alone and not of APRP as a whole or USAID.

EXECUTIVE SUMMARY

This paper presents the analytical framework that underlies a large part of MVE's impact assessment program. A subsector approach, using a structure, conduct, performance paradigm, was used to assess changes in the organization, behavior and performance of key commodity subsystems in Egyptian agriculture: cotton, rice, wheat, fertilizer.

MVE began its impact assessment program with four subsector baseline studies that documented in detail how those subsectors were organized and performing early in APRP, covering the baseline years of 1996/97 and 1997/98. Four endline studies were carried out in 2001/02 which described changes in subsector structure and performance during and by the end of the USAID-funded policy reform program. These studies attributed certain changes to APRP policy and regulatory reform, while concluding that some changes were due to other factors, such as changes in domestic economic conditions, the world market situation, the position of the GOE, or other exogenous factors.

Many of APRP's policy and regulatory reforms were targeted to specific commodity subsectors and influenced the ways in which agribusiness firms and industries behaved. In longer term programs of agricultural policy reform, such as APCP/APRP, policy-makers typically tackle broad, sector-level policy constraints initially. As the program progresses, policy reforms are often addressed to solve a set of problems tied to a particular commodity subsystem, each with its particular organization and performance.

A subsector is a vertically linked chain of production, marketing and transformation activities that move an agricultural commodity from the field to final distribution to consumers. Value is added as commodities move and are productively transformed across subsector stages, which are each separate industries.

Subsector analysis uses an underlying framework from industrial organization theory in economics: structure, conduct, performance. This approach places heavy emphasis on how a commodity subsector is organized (structure), which can influence how participants in the subsector behave (conduct), and ultimately how the subsector performs in the aggregate (and also typically stage by stage, or industry by industry). Behavior or conduct is often inferred from observations about firms operating within industries and subsectors. The broader macroeconomic environment and the basic conditions underlying the subsector can also influence structure and performance.

Subsector analysis is a dynamic approach that examines how markets and industries respond to change in the form of shifting international supply and demand for a commodity, technological change in the food/fiber system, and new knowledge of organizational or management techniques. Subsector analysts pay more attention to agribusiness firms that actively coordinate marketing systems, such as producer/exporters, wholesale traders, processors and exporters. Key firms in any of these industries can serve as channel captains who play a large role in organizing a subsector, structuring exchange relationships, and using their strategic vantage point (and market power) within the subsector to bring about positive changes that lead to improved system performance.

This paper defines key terms used in subsector analysis and structure, conduct, performance studies, defines important areas of investigation, discusses the difference between conventional economic impact assessment and subsector analysis, and gives a couple of examples of how subsector analysis has been used under APRP.

1. INTRODUCTION

1.1 APRP MVE's Program of Impact Assessment

In the fall of 1997, the MVE Unit undertook a comprehensive planning exercise to initiate its program of economic impact assessment. This program was designed to go beyond evaluating whether policy and regulatory reforms were actually implemented to assess in depth whether the reform program made a difference.

The usual economic impact assessment focuses on how producers and consumers are affected by policy reform programs. In the simpler case, the welfare of producers and consumers is compared before and after the program was implemented. This presupposes some form of socio-economic, agricultural production, and food consumption baseline information, typically gathered shortly after the program has begun.[1] In the case of APRP, IFPRI undertook a nationally representative household sample survey in early 1997, administered in a single visit to 2,700 rural and urban households. IFPRI's survey was especially targeted to households' food expenditures and food consumption practices. It was not designed to provide a baseline on agricultural production, input use, crop and livestock disposal, farm assets, and returns to different crop rotations and crops.

MVE carried out a producer survey of 180 farm households in April-May 1997, which was designed mainly for verification purposes, but which collected some basic information about agricultural production and returns. GTZ/CSPP surveys of returns to summer crops in 1997 and 1998 (see Selzer, 1998) and farm income data collected and analyzed by MALR/EAS and APRP/RDI (see MALR/EAS et al., 1999) also provided valuable baseline data.

Near the end of APRP in November 2001, MVE conducted a producer survey of about 750 farm households in ten governorates to obtain information about assets, input use, crop production and disposal, and farmers' opinions about the impact of reform. With this information, MVE has been able to do a good before/after analysis that shows how farm households have fared during the APRP program years and how returns to different crop rotations have changed over time (see Morsy et al., 2002). MVE has not, however, collected any data on household food consumption patterns and the full basket of non-food expenditures that IFPRI covered in its 1997 survey.

A more complex and convincing analysis of changes in the welfare of producers and consumers compares the with and without program (or policy reform) cases. Analytically and conceptually, this is far more challenging and requires formal modeling methods that are mastered by few and understood by fewer, particularly developing country policy-makers. MVE elected not to pursue this approach for several reasons. First, MVE has carried out studies that show that secondary data, on which models are based, are flawed in Egypt (see Morsy et al., 1998). With a strong commitment to data quality, MVE adheres strongly to the view of modeling where the quality and usability of model outputs depend heavily on the quality of the data inputs.[2] Second, a large and complex agricultural sector model was examined and

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[1] Occasionally, a program or project benefits from a pre-activity baseline, but this is not usually the case.

[2] MVE has funded several implementation activities with the MALR/EAS that have been designed to improve data collection in the new lands, yield estimates for some key crops (cotton, wheat), and improved

tested by an agricultural economist specialized in mathematical programming who discovered that the model produced counter-intuitive and hard-to-interpret results (see Keith, 1999). Third, MVE is well aware that the developing country landscape is littered with well-intentioned but largely failed modeling efforts that proved to be of little use to policy-makers. Fourth, MVE welcomes further, follow-up efforts to develop usable formal models for economic impact assessment of agricultural policy reform programs in Egypt.

1.2 The Comparative Advantage of Using Subsector Analysis

While the usual assessments of economic impact focus on producers and consumers, subsector analysis also covers traders, processors, importers/exporters and other important participants in commodity subsystems. By carefully examining the sets of incentives, risks, constraints, and opportunities facing economic agents at each stage of the value-added chain, a subsector analysis is concerned with the welfare, competitive (or collusive) behavior, and financial performance of those participants. With a positive enabling environment, created by pro-business policies and regulations, subsector participants have incentives to buy and sell commodities, adding value through productive transformation (grading/sorting, processing, packaging, storage, transport), innovating to cut costs and improve products and services, and satisfying customers. Crafting of a competitive economic environment minimizes opportunities for traders and processors to offer poor quality goods or to gouge buyers or sellers on prices. Competitive markets discipline cheats, adulterators, and shirkers. Effective government regulation helps in this regard (to reinforce market discipline).

These considerations and others, such as technical, allocative and economic efficiency, employment, and international competitiveness, are what subsector studies address. The approach is a hybrid between industrial organization theory of economics and the competitiveness school of business/management studies. Subsector analysis grew out of the agricultural marketing field of agricultural economics. Agricultural commodities have particular attributes (biologically based, perishable) that lead agricultural economists to place a heavy emphasis on economic coordination between firms at adjacent stages of subsystems. Good coordination leads to wholesome, tasty, fresh products, while poor coordination leads to spoilage, unpalatable products, and economic losses.

To summarize, subsector analysis has a different set of foci that are quite different from the conventional producer/consumer surplus types of analyses:

- Degree of competition in food industries and within subsectors
- Innovation and technological change and their impact on performance
- Economic incentives to invest, innovate, and improve organization and management at the firm level
- How international supply and demand conditions affect domestic production of agricultural commodities and domestic and international market opportunities
- How well coordinated a subsector is across stages and the result in terms of product cost, quality, timeliness, and packaging.

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area estimation.

Subsector analysis focuses on changes over time in the structure, conduct and performance (S,C,P) of a subsector, particularly how agribusiness firms respond to policy change and other forces, such as changes in world market conditions, technology and relative prices. Subsector analysis emphasizes changes in firm, industry and subsystem behavior over time. Policy reform programs are designed to change the enabling environment and set of economic incentives facing subsector participants, which in turn lead to changed behavior and not only enhanced welfare.

In conventional impact assessment, the focus tends to be on producer and consumer welfare, as evinced in producer incomes and assets (investments), consumer budgets and food choices, and consumer calorie intake and nutrition. Most of the analysis tends to be comparative statics, where researchers identify who wins and who loses from one point in time to another. Finally, in many conventional marketing studies, analysts focus on prices and marketing margins. While these are important components of subsector studies, they are a point of departure for looking at the competitiveness and distribution of returns across subsector stages.

1.3 Why the Four Particular Subsectors are Part of MVE's Impact Assessment Program

As part of its impact assessment program under APRP, the MVE Unit identified four priority subsectors for impact assessment: cotton, rice, wheat, fertilizer. The justification for choosing these four subsectors in late 1997 was as follows.

Cotton was the subject of numerous APCP and APRP benchmarks (see Goldensohn, 1999 and Holtzman, 2000), and hence a large cash transfer value can be placed on those benchmarks since policy condition-driven reform tranches began in the late 1980s. Cotton is also the number one agricultural export commodity (as lint), it is the major raw material used in the largest agro-industry in Egypt, the spinning and weaving industry, and it employs many people across vertically linked industries (from seed cotton assembly to manufacture and export of ready-made clothes).

Rice is a second major summer crop that competes for irrigated land and water with cotton (and maize). Area cultivated to paddy doubled during the 1990s, in part at the expense of cotton, which witnessed a 500,000 feddan decline. Paddy was also planted on newly reclaimed land on both sides of the Delta, as it is often cultivated first on new land before other crops (or fruit trees) are planted. The rice market was liberalized under APCP from 1990/91 to 1993/94, during which compulsory deliveries to public sector mills were phased out and cancelled, paddy and rice prices were freed, and private sector participants were allowed to enter paddy assembly and wholesaling, milling, and trading (including exporting) of milled rice. The private sector responded to these policy changes relatively quickly, although private investment in new rice-related enterprises was lagged and the impacts of the reforms and private sector responses did not fully work their way through the agricultural economy until APRP got going.[3]

[3] Technically, the start date for APRP was the beginning of the 1995/96 fiscal year, which was when the GOE and USAID signed the first Memorandum of Understanding. By this point, the first tranche of APRP policy benchmarks had been designed and agreed. Since the technical assistance teams under APRP did not begin to arrive until November 1996, the de facto beginning point for APRP can be considered the 1996/97 agricultural year. Note that the first tranche *Verification Report* covered the period through 30 June 1997.

The rice-related policy benchmarks under APRP focused on privatizing public sector rice mills and conservation of water through planting of short-season varieties and better management of irrigation water supplies. Although there were far fewer rice-related benchmarks under APRP than cotton-related benchmarks, rice continued to be an important part of the policy reform agenda. Although repeated attempts at lowering the tariff on imported rice failed, APRP succeeded in heightening consciousness of the opportunity cost of growing a high water-consuming crop like rice and in introducing better water supply management controls. The issue of water pricing remains moot, however, and it will likely be difficult to address for years to come. High levels of water behind the Aswan Dam during APRP bought Egypt time in that water scarcities have not yet emerged.

Although the wheat subsector was the subject of far fewer benchmarks than either rice or cotton, subsidized bread remains the key starchy staple of many Egyptian consumers, particularly poorer ones. Much of IFPRI's work centered around determining who the poorest consumers, most deserving of food subsidies, are, as well as policy distortions and constraints that lead to inefficiencies and leakages in wheat marketing and milling. Wheat is critical in assuring Egyptian food security, and area cultivated to wheat makes it the number one winter season crop in most years.[4] It is also important to highlight that domestic wheat production has covered no more than 60 percent of national requirements during APRP. Egypt remains one of the world's largest wheat importers, and imported wheat is milled into flour (72% or *fino*) that is used in baking products that are purchased by non-poor consumers. In other words, 72% flour milling and baking constitutes a distinct wheat market channel that is subject to numerous controls and restrictions (and opportunities for leakages and distortion). As such, the wheat subsector remains overall one of the most highly regulated and least reformed subsectors in Egyptian agriculture.

Liberalizing the fertilizer trade was the subject of many policy benchmarks and an enormous amount of effort under APCP in the first half of the 1990s. Egyptian farmers apply very high levels of nitrogen-based fertilizers, and fertilizer is a key purchased production input. In several short years, the fertilizer subsector in Egypt went from being completely dominated by the public sector to one with a thriving private trade and was hailed as a major policy victory. A policy reversal in 1995/96, when the GOE imposed a duty on fertilizer imports and returned most fertilizer distribution to PBDAC, led MVE to consider it high priority to monitor the re-introduction of the private trade under APRP and the relaxation of controls on trade. Hence, the fertilizer subsector, the subject of very few benchmarks under APRP, became a fourth priority subsystem for continued monitoring.

A fifth subsector, the horticultural subsector, received progressively increasing attention under APRP, as later tranches contained a greater number of policy benchmarks related to horticulture. Unlike the other four subsectors, the horticultural subsector did not benefit from a baseline study early in APRP, although APRP/RDI completed a diagnostic assessment of policy constraints (see Pietrus, **Horticulture Subsector Policy and Regulatory Constraints**, 1999) prior to developing benchmarks. MVE decided to do an

[4] The two main winter season crops are wheat and berseem. Berseem consists of a long-season crop, a short-season crop, and a seed crop. Egyptian analysts consider these three types of berseem as separate crops. When the area planted to these three berseems is totaled, it can exceed wheat area in some years. In winter 2001, total berseem area was 2.62 million feddans, compared to 2.34 million feddans planted to wheat.

initial assessment of the preliminary impacts of APRP benchmarks related to horticulture in the final year of APRP in recognition of the emerging importance of this subsector as an agribusiness investment opportunity, a generator of jobs, and a source of foreign exchange earnings through exports to high-income markets. The approach used to gauge APRP impact on the horticultural subsector was more of a policy-oriented rapid appraisal, rather than a full-blown subsector study using an underlying structure, conduct, performance framework.

1.4 The Analytical Framework Underlying APRP's Subsector Studies

The four key subsectors, selected for the reasons described above, became a core part of MVE's impact assessment program under APRP. APCP focused largely on issues of farmer choice of crops and market outlets, crop pricing and policies affecting producer prices, farmer access to inputs (especially fertilizer), and liberalization of marketing systems at the producer-first handler interface and at the export level. In contrast, APRP focused far more on the second-generation of policies that would complete liberalization of key commodity subsectors, focusing significant attention on agribusinesses beyond the producer-first handler interface.

The subsector approach was chosen for the four sets of impact assessment studies for several reasons:

- Many APRP policy benchmarks were subsector-specific. Structural adjustment programs, carried out with World Bank and IMF assistance in the 1980s and early 1990s, focused on macro variables and policy reforms. Some APCP and APRP benchmarks were agricultural sector specific, but subsequent reform efforts require going beyond economy-wide and sectoral reforms to changing policies, regulations and practices in specific commodity subsystems.
- Policy and regulatory reform in the agricultural sector (and agribusiness system) and under APRP increasingly focused on real constraints faced by private businesses in key commodity subsystems. An important part of the MVE analytical agenda was to assess the impact of how those businesses responded to subsector-specific reforms.
- Changes in the organization or structure of commodity subsystems was an important emphasis of APRP. Private sector entry, participation, investment, and market shares ended up being key indicators that were monitored by MVE. The subsector approach, under-girded by industrial organization theory, pays significant attention to subsector structure and how this affects the behavior of (private and public) participants and subsystem performance.

A subsector approach is not necessarily the best way to examine cross-cutting policy issues and reforms, where the impacts are broadly diffused across the agricultural economy. For example, reforms in agricultural sector lending and agribusiness finance can affect many commodity subsectors. Analyzing the impacts of such reforms could be best gauged by doing surveys of the major groups of beneficiaries—producers and agribusinesses—and their access to and use of finance. The banking or finance system itself is not a subsector but rather an industry that serves numerous commodity subsystems. An initial diagnostic study of problems in the banking/finance system related to agricultural lending could use a structure, conduct, performance approach, but the approach would be horizontal or industry-specific, not vertical and hence subsectoral.

2. KEY DEFINITIONS AND CONCEPTS OF SUBSECTOR ANALYSIS

The following key concepts underlie subsector analysis. Subsector analysis is a systems approach that takes many factors into consideration in assessing performance. Potentially, systems approaches can appear overwhelming and may seem to have massive data requirements, as shown in Exhibit 1. Choosing what to emphasize should be driven by the impetus for change, which can be the introduction of new technologies, changes in world market conditions, or contemplated or implemented policy changes. Tracing the impacts of such a change through a complex and elongated commodity subsystem is the essence of using subsector analysis in assessing economic impacts.

Exhibit 1 is a checklist, in matrix form, of important areas of investigation that might be undertaken in a subsector study. Much of the information listed in the matrix is available, though perhaps from a wide variety of disparate sources. A major challenge in subsector studies is to focus on the minimal and necessary information needs for the purpose of the study, whether it be an initial diagnostic assessment, a focused update, a baseline study for impact assessment, or a rapid appraisal type of project/program evaluation. A potentially important contribution of a thorough subsector baseline study, used in impact assessment, is to pull together available information in a coherent and integrated package. If done well, such a baseline study can serve as a useful reference point for other analysts, policy-makers and their assistants, selected trade association representatives and private industry managers, and evaluators for years to come.

Despite the potential complexity of a comprehensive subsector study, as reflected in Exhibit 1, a few points are worth highlighting. First, commodity characteristics and consumption patterns are listed as the first two key areas for good reason. Agricultural products are generally quite perishable and require special post-harvest handling and care. Maintaining the quality and freshness of food products requires significant investments in storage facilities, including cold storage, pre-cooling, sorting, transport (often refrigerated), and handling equipment. The fact that consumption patterns are given special emphasis is consistent with a fundamental tenet of subsector studies and food systems research: demand drives (or pulls commodities through) the subsystem.

Exhibit 1, consistent with the S,C,P approach, includes food system participants and organization and subsector operation or conduct as key areas of investigation. The domestic supply situation, commodity price relationships, and international trade considerations also receive attention. The marketing system infrastructure and government institutions and policies are part of the basic conditions of a commodity subsector that can influence costs, incentives, and willingness or private participants to invest. Finally, the timing of a subsector study conditions what an analyst is able to observe. Market flows and processing activity may be highly seasonal.

Exhibit 1: Key Areas of Investigation in Commodity Subsector Studies

AREAS OF INVESTIGATION	COMPONENTS	METHOD OF INQUIRY	REASONS FOR INVESTIGATING
1.Commodity Characteristics	a) Different grades, end uses. b) Degree of bulkiness, perishability. c) Physical/handling requirements. d) Degree/type of processing. e) Types and magnitude of post-harvest losses. f) Packaging methods and materials for shipment and sale.	1)Review commodity manuals, studies. 2)Develop commodity calendars showing periods of production and transformation. 3) Observation of handling, processing, storage, any sorting or grading, and packaging. 4) Assess nature and degree of post-harvest losses in a rough way.	a) Commodity characteristics can influence operation of the subsystem, which functions are performed, how they are performed, and the relative cost at which they are performed. b) The nature of the production process influences the timing and magnitude of producer sales and marketed flows. c) Post-harvest losses are high in many countries. Identification of causes and means of reducing losses can expand food availability.
2. Consumption Patterns	a) Seasonal and secular trends in domestic and export markets. b) Disaggregated consumption patterns by socioeconomic and ethnic group. c) Future market prospects.	1) Review consumption studies, food balance sheets, and demand projections. 2) Construct food balance sheets if data are available. 3) Interview nutrition/consumption researchers, selected commodity importers, exporters, institutional buyers, and rural and urban consumers.	a) Demand drives (or pulls commodities through) subsystems. b) The strength and seasonality of demand affect production and storage incentives, as well as the direction and magnitude of marketed flows. Longer run trends and opportunities affect investment decisions of participants in the subsystem.
3. Supply Situation	a) Production by year and by region for recent years, noting trends and variability. b) Stocks for transformation and consumption by season and region. c) Flows from major supply areas to major markets, including imports and exports.	1) Review commodity studies. 2) Interview large wholesalers, parastatal managers, crop production researchers, importers, exporters, processors, cooperative and trade association officials. 3) Use map to show flows and apparent surplus and deficit areas. 4) Describe seasonal variation in stocks and flows.	a) Supply and demand are basic elements of economic analysis. b) Production levels and variability affect prices (depending on elasticities), returns via the price mechanism, and risk perceptions of producers. c) The level of stocks during different periods affects seasonal variation in prices and commodity availability. d) Shifts in supply over time may indicate response to policies, technological change, the institutional environment, and alternative institutional arrangements.
4. Price Relationships and Seasonality	a) Secular trends in real prices at the farmgate, wholesale and retail levels. b) Seasonal and cyclical trends in prices. c) Changes over time in relative price relationships. d) Changes over time in input/output price and (product) value/(input) cost relationships.	1) Gather secondary price data for the commodity and close substitutes/complements for a ten or more year period. 2) Deflate prices or express prices in constant price terms. 3) Analyze secular, cyclical and seasonal price trends, and changes in relative price relationships over time. 4) Estimate supply and demand relationships if data permit. 5) Calculate input-product price ratios, and/or value-cost ratios over several years.	a) Relative prices are a measure of the structure of incentives facing food system participants. b) Changing relative price relationships may indicate shifts in production and marketing incentives, especially if coupled with accurate production and marketing cost data. c) The domestic pricing structure relative to international prices provides insight into regional and national comparative advantage. d) Input-product price and value-cost ratios are proxies for the profitability of agricultural production.

5. Food System Participants and Organization	a) Marketing channels and commodity subsector stages. b) Important assembly, redistribution and terminal markets. c) Types, numbers, and geographical distribution of firms at key subsector stages. d) Prevalence and importance of alternative institutional arrangements, such as contracts, vertical integration, direct marketing, cooperatives, and spot markets.	1) Review previous commodity studies. 2) Check if existing enumerations or sample frames in government agencies (e.g., licensing offices). 3) Interview knowledgeable observers of subsectors and selected participants. 4) Draw a subsector map (flow chart) showing principal stages and marketing channels. 5) Use a geographic map to show important marketplaces. 6) Identify firms using alternative coordination mechanisms and do case studies.	a) Food system organization (or structure) influences the conduct of participants, which in turn affects performance. b) High levels of concentration of firms at particular stages of the food system may lead to higher production/marketing costs than under conditions of lower concentration. c) Prevalence of myriad small firms who fail to specialize at one or more levels of the food system may lead to scale diseconomies and high costs. d) Analysts need to examine the benefits and costs of alternative institutional arrangements as the food system evolves.
6. Subsector and Food System Operation or Behavior	a) Practices and strategies of subsystem participants (individuals, firms, organizations for procuring inputs, processing, storage and marketing of outputs). b) Vertical coordination mechanisms: exchange arrangements, risk-reduction/sharing, information dissemination. c) Sources, uses and distribution (equity) of production and marketing information. d) Adaptability and responsiveness of subsystem to shifting supply/demand, exogenous shocks, policy changes and uncertainty. e) Evidence of market power.	1) Identify key stages and participants. 2) Develop informal interview guidelines. 3) Sample purposively based upon knowledge of the population of potential respondents from previous records or studies, or from the above characterization of subsystem (#5). 4) Conduct selected in-depth informal interviews. 5) Crosscheck findings with other subsystem participants and knowledgeable observers.	a) Operation and behavior in the aggregate affect food system performance. b) Information is costly to gather and process, and access is unequal. This affects the ability of different size firms to respond to changing market conditions. c) The adaptability and responsiveness of commodity subsystems to changing conditions and uncertainty affect levels of output and performance, as well as the continued viability of the subsystem in a particular country. d) Better vertical coordination can improve the matching of supply and demand at successive stages of the food system and reduce risk. It is important to determine if this is associated with limited entry, unequal access to information, and unequal sharing of risks and rewards.
7. Marketing System Infrastructure	a) Physical infrastructure (transport, including roads, ports, airports and waterways; market-places; storage and processing facilities; communications; electricity; water supply). b) Infrastructure adequacy and bottlenecks. Evidence of excess or unutilized capacity.	1) Review studies of transportation and communication infrastructure, storage/processing capacity and utilization, and marketplaces. 2) Inspect and assess the adequacy of a sample of the above. 3) Use a map to show key infrastructure. 4) Identify bottlenecks and constraints, uneconomic excess capacity (or inappropriate scale).	a) In some developing countries infrastuctural constraints constitute severe bottlenecks that slow food system development and penalize isolated areas and regions. b) Excess, underutilized capacity suggests uneconomic investments and resource misallocation.

8. Government Marketing Institutions and Polices	a) Regulatory environment: rules; input and product regulations; laws affecting marketing and trading activities; property rights. b) Public marketing institutions (parastatals, cooperatives, joint ventures); the extent and nature of their participation in marketing; effect on the behavior and performance of private participants in the food system. c) Macroeconomic policies: price policies; exchange, interest, wage rate policies; fiscal and monetary policies. d) Banking and credit policies.	1)Regulations: use informal interviews with subsector participants to identify vexing or constraining regulations. Do follow-up interviews with selected policy-makers. 2)Institutions: interview managers, determine the organizational mandate, outline its functions, estimate its market share, examine its pricing policies, assess the effectiveness of distribution and marketing services, and assess the impact of its participation on system performance. 3)Policies: review macroeconomic assessments of the World Bank, IMF or others. Assess the impact of policies on the organization and operation of the food system & the incentives of different system participants. 4)Interview bank and credit agency officers. Determine whether credit is subsidized, how it is rationed, who gains access, and the sectoral distribution of credit.	a)The regulatory environment generally and specific regulations in particular affect the behavior and incentives of food system participants. b)Public marketing institutions dominate food systems in some countries, influence the organization, operation and performance of food systems in many countries, and generally affect the behavior of system participants. c)Macroeconomic policies condition and shape the environment in which system participants make decisions about investments and operations. d)All of the above contribute to food system stability and/or uncertainty, which greatly influence behavior. e)Banking and credit policies determine who gains access to formal credit, which is often subsidized.
9.International Trade and Commodity Competitiveness	a)Commodity exports and world market situation. b)Imports of the commodity or substitutes and their impact on domestic production, markets and prices. c)Trends in exports and imports. d)Likely changes in exports and imports, and emerging market opportunities or dependencies. e)The competitiveness of exports in particular foreign markets.	1)Analyze trade quantity and price data available in statistical abstracts or outside assessments. 2)Review international commodity production, price and trade forecasts. 3)Compare prices of domestically produced commodities with international prices. 4)Analyze the competitive position of a specific export commodity in key markets. Examine trends in export levels, market shares and prices, and ascertain reasons for changes. 5)Interview exporters and importers and major domestic buyers in the foreign markets. 6)Visit export-staging and import-receiving facilities. Inspect exported produce in terminal markets and compare with that of competing suppliers.	a)Few, if any developing country food systems are autarkic. International trade in agricultural commodities affects production and marketing incentives, consumption patterns and preferences, and the behavior and opportunities of system participants. b)International market conditions influence developing countries' comparative advantage in production and export (import) of agricultural commodities. c)In assessing export competitiveness, site visits to markets and buyers' premises and in-depth interviews with importers and end users in foreign markets provide a good picture of how a country's exports compare with those of other suppliers. Such visits to foreign markets often yield concrete input and insights into what needs to be done to meet international grades and standards generally and the requirements of particular buyers and end users.
10. Representativeness of the Period Under Study	a)Timing of the study relative to the annual commodity production and marketing cycle. b)Agricultural and economic characteristics of the year of the study relative to earlier years or climatic cycles.	1)Compare rainfall data and production estimates with earlier years. 2)Compare economic data: GDP, balance of payments, inflation rates, trade patterns, exchange rates. 3)Assess political factors: any change of government, policy changes, movements towards (or away from) democracy.	a)The period of observation may be unusual with respect to climate, agricultural production, economic and political conditions, and the effects of recent changes. b)Food system development is an ongoing process. Historical perspective of long-run patterns of change in basic economic, institutional, political and environmental conditions is valuable in understanding food system development.

While this discussion of key areas of investigation is perfunctory, the material laid out in Exhibit 1 does provide a framework around which analysts can organize subsector studies. Some areas and quite a few sub-areas of investigation may have been well covered by previous studies and are hence already well understood (and can be skipped or updated quite easily). Other areas may be poorly understood and hence will require significant investment and, in some cases, perhaps original survey research. Under APRP, the MVE Unit decided to conduct a formal survey of 59 commercial rice mills in late 1998, as this milling industry segment had grown rapidly from a low base in the early 1990s and was not well understood. This survey generated a lot of usable empirically based output that was used selectively in preparing the *Rice Subsector Baseline Study*.

2.1 Food System

A food system has horizontal and vertical dimensions. The horizontal dimension refers to firms within a particular industry, or to a particular stage of the food system where a similar set of functions is performed. The vertical dimension refers to subsystems or subsectors of single commodities or relatively homogeneous groups of commodities. This dimension is vertical, because it cuts across stages of a subsystem, where different production, assembly, processing and distribution functions are performed. As conceptualized by Shaffer (1973), a subsector incorporates productive transformation and value-adding at each stage of a subsystem.

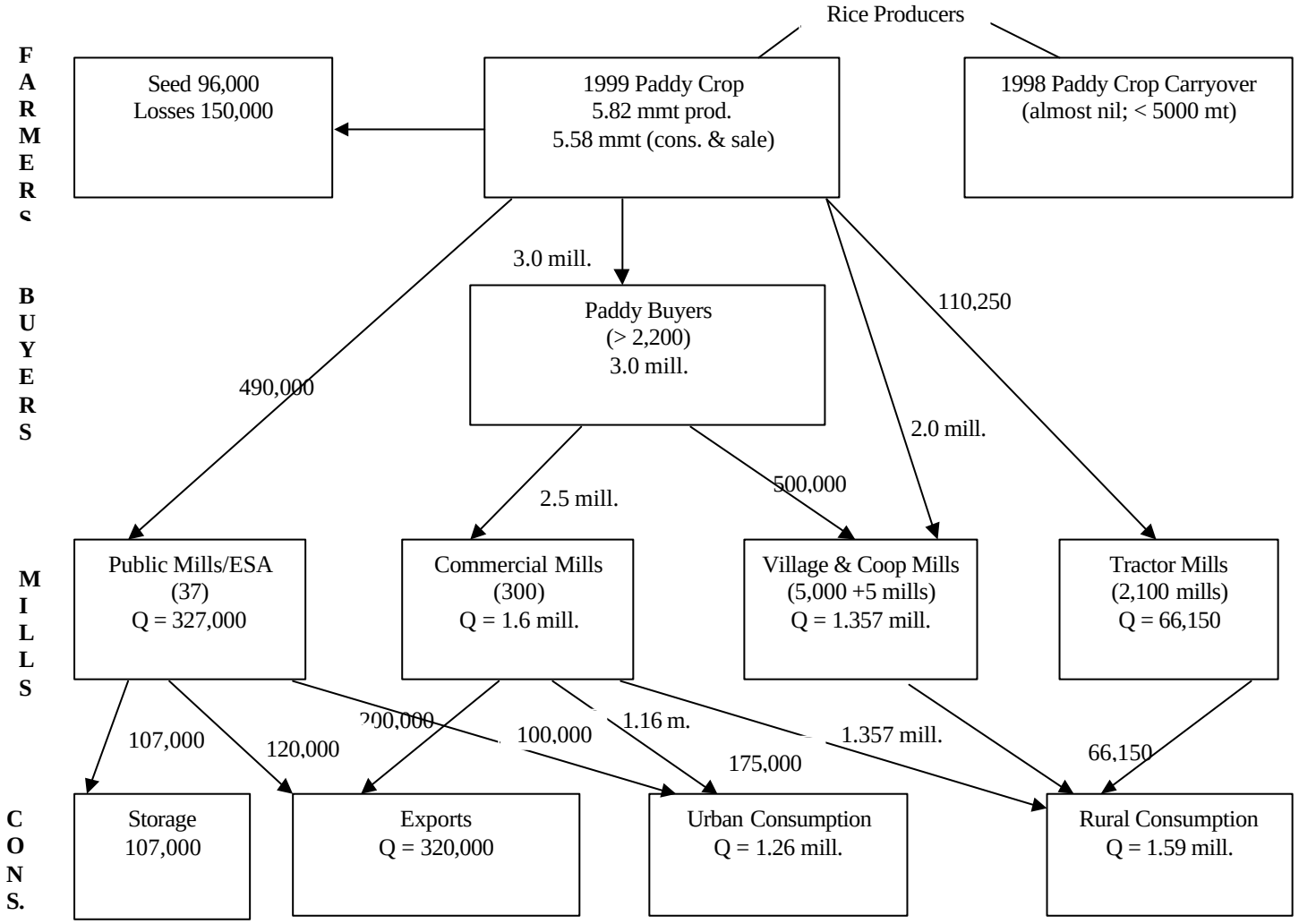
The vertical emphasis of subsectors is best captured in a subsector map, which is a useful way to depict subsector stages and the groups of participants at those stages and different market channels. Subsector maps can be used to show the volume of physical input and product flows, financial flows, information flows, and the value of output at each stage (from each participant group) and sales/transfers between stages. Exhibit 2 is a map of the Egyptian rice subsector for 1999/2000. It shows physical input and output flows, as well as quantities processed at the milling stage. Other subsector maps were developed early in APRP for the cotton, rice, wheat, and horticultural subsectors.

2.2 Subsector Approach

The subsector approach focuses on the performance consequences of alternative forms of industrial and economic organization. Exhibit 3 provides a schematic overview of the structure, conduct, performance approach (of industrial organization theory) as applied to subsector analysis. Basic production, consumption, policy/regulatory, and macroeconomic conditions shape the opportunities and limits that face individual firms operating in a commodity subsystem. The structure or organization of the subsystem influences how firms behave (coordinate or attempt control other firms) within and across stages of the system, which in turn leads to performance consequences. Basic conditions and a particular subsector structure do not completely determine performance outcomes, but they can strongly influence how well and efficiently a food system performs. Key performance attributes are as follows:

- Allocative accuracy
- Stability of output, prices and profits
- Technical and operational efficiency (within and across stages)

Exhibit 2: Rice Subsector Map, 1999/2000



- equity with regards to the distribution of returns, rights and control vs. investments and risks
- subsector adaptability
- level and type of employment
- accuracy, adequacy and equity of information distribution.

2.3 Demand Drives the Food System

Many developing country governments and donor agencies have historically shown a production or supply-side bias in their policies, interventions or projects. They have emphasized increasing production and paid far less attention to commodity marketing,
Insert Exhibit 2 here; Rice Subsector Map, 1999/2000

processing, and market development and export promotion. Taking a food system perspective and using a subsector approach, an analyst views demand as the force that pulls commodities through subsystems, strongly influencing the forms in which commodities are marketed, processed, packaged, and sold. Consumers are considered as subsector participants, because their expenditure patterns influence agricultural production and marketing decisions of upstream participants. Shifts in demand induced by changes in relative prices, in the purchasing power of consumers (effective demand), and in tastes and preferences affect in a significant way the set of incentives facing participants throughout the subsector to supply products to consumers or end users in forms, at times, and at places that they desire.

2.4 Coordinating Agents, Institutions and Mechanisms

Coordination of food systems is an active process undertaken at different levels. Firms at particular key stages of a commodity subsystem are coordinating agents. Wholesale traders or processors are located at key stages and handle or process large volumes of a commodity, coordinating assembly, transformation and distribution. Government agencies that provide needed services, commodity or agribusiness trade associations, and formal groupings of producers, traders, and processors act as coordinating institutions. Various types of contractual arrangements, alternative forms of markets (spot, futures, auction), electronic information exchanges, and vertical integration are coordinating mechanisms. Uncertainty in agricultural production, the perishable nature of agricultural commodities (limited storage and shelf lives), and increasingly stringent quality and phyto-sanitary requirements are strong incentives for subsector participants to devise effective coordinating institutions and arrangements.

Exhibit 3: Structure, Conduct, Performance Paradigm as Applied to the Commodity Subsector Approach

Basic Conditions

Production trends and geographic distribution
Consumption characteristics
- Growth or decline (in domestic and foreign markets)
- Price, income and cross elasticities of demand
- Differences by socioeconomic and income group
- Rural/urban differences

Time characteristics of production and market cycles
Type and degree of uncertainties: commodity price patterns, government policies, weather/climate patterns, access to and importance of external markets
Laws and government policies and regulations
Macroeconomic variables as incentives or disincentives: exchange rate, interest and wage rates, inflation rate and differential impact

Firm Decision Environment

- Alternatives
- Incentives
- Control and Influence

Conduct

Industry	*Subsector*
Product strategy Pricing behavior Advertising Research and innovation Mergers and divestitures Risk management practices	Efforts to shift control • Type of exchange used Coordination activities • Prediction of future supply, demand, and price • Information communicated • Quality specification • Scheduling and timing synchronization • Efforts to influence inter-stage cooperation/conflict Process of determining terms of exchange (private, treaty, administered, bid-offer-acceptance, etc.) Response to change forces

Structure

Industry Structure	*Subsector Organization*
No. and size of buyers and sellers Entry and exit conditions Product characteristics • Perishability • Quality requirement • Differentiation Technology char./cost functions • Capital intensity; minimum efficient firm size • Rate of change Capacity Specialization/diversification Vertical integration Financing and credit characteristics Collective organizations • Cooperatives • Trade associations Business objectives, attitudes and capabilities	Functional structure: location, timing and clustering of functions No. of stages No. of parallel channels Information system • Type of information (grades, market conditions, etc.) • Distribution • Cost Structure of authority, rights and controls: • Decision autonomy Exchange institutions (auctions, buying stations, electronic exchanges) Types of exchange (spot markets, contracts, tying agreements, etc.) Risk-sharing institutions and arrangements Inter-stage differences (location, size of enterprise, seasonality, production characteristics): nature of assembly, sorting and assembling tasks

Performance

Industry	*Subsector*
Technical and operational efficiency Pricing efficiency (profit and output levels) Product characteristics • Quality / wholesomeness • Variety Progressiveness (process and product) Selling activities • Expense • Influence on consumption patterns and social values Market access and/or foreclosure	Allocative accuracy: extent to which supply offerings match demand preferences with regard to quantity, quality, timing and location Stability of output, prices and profits Technical and operational efficiency • At each stage and in linking stages (transaction costs) Equity with regard to distribution of: • Returns vs. investments and risks • Rights and control vs. investments and risks Accuracy, adequacy and equity of information distribution Subsector adaptability Level and type of employment Waste and spoilage • Product waste • Resource conservation • Capacity utilization

Adapted from Bruce W. Marion and NC 117 Committee, **The Organization and Performance of the U.S. Food System**, D.C. Health and Company, Lexington, Massachusetts. 1986.

3. CONTRASTING SUBSECTOR AND INDUSTRY ANALYSIS

In doing baseline and endline impact assessment studies for APRP, the MVE Unit applied the structure, conduct, performance framework of analysis to both commodity subsectors and industries within those subsectors. This section shows how the emphases and focal points change, depending on how you apply S,C,P—vertically (in subsector analysis) or horizontally (in industry analysis). As an example, the MVE Unit examined in depth the structure, conduct and performance of the seed cotton trading and ginning industries in the cotton subsector, as well as looked at which level of the subsector public and private participants exercised the most control and market power. Similarly, in the rice subsector work the MVE Unit paid significant attention to the rice milling industry, a key subsector stage in a period of rapid transition, and the rice exporting industry. One reason for focusing on these industries was that large commercial rice millers and exporters (often one and the same) play an important organizing and coordinating role in the marketing system.

In some subsector studies, a particular industry becomes the subject of a lot of attention, because it is believed to be important but is not well understood, factual information is outdated or thought to be inaccurate, and the conventional wisdom about that industry is judged (ex ante) to be wrong or misleading, which may influence policy-makers in undesirable ways. Policy-makers might ignore a key industry in a subsector, penalize it through ill-considered policies or regulations, or have exaggerated notions of industry profitability (and therefore seek to tax it heavily or restrict its expansion).

The discussion below draws heavily on Exhibit 3. The three boxes in Exhibit 3 showing structure, conduct and performance attributes differentiate between *industry*- and *subsector*- specific characteristics. In doing subsector analysis, we need to remember that the primary focus is on the vertical dimension; we are interested in how productive, efficient, and effective commodity subsystems are in the assembly, transformation (processing), and distribution of agricultural products, whose perishable nature places special demands on subsector participants to handle, move, and process those products in a careful and timely way. Hence, coordination of physical product, information, and financial flows within the subsector is a critical consideration.

3.1 Structure

At the subsector level, structure concerns the number and market power of different stages, as well as different marketing channels. The key focal point is identifying where market power resides in the subsystem. Certain participants, such as large wholesale traders, processors or exporters, typically exercise considerable market control. A large proportion of a commodity may pass through a handful of firms at a particular stage of the subsystem. In Egypt, the extent to which public or private companies dominate a subsector is an important consideration. In the early days of APRP, public sector cotton trading com+panies dominated the cotton marketing system, exercising leverage over smaller cotton traders (who supplied public traders on contract), private exporters (who often depended on public traders for lint to honor export contracts), and ginning companies. Other key structural characteristics of subsectors are exchange and risk-sharing arrangements.

Structural characteristics of industries include the number and size of buyers and sellers, industry entry and exit conditions and barriers, product characteristics (at a particular level of transformation), the role of collective or advocacy organizations, technology characteristics of a particular industry, and the degree to which larger firms in an industry attempt to better control their access to inputs and their control over output distribution and sales through vertical integration, contracts or other means.

3.2 Conduct

In applying the structure, conduct, performance paradigm to subsector analysis, analysts examine the efforts of participants to shift control, rewards and risks. The specific coordinating activities or efforts of subsector participants, the extent to which there is cooperation or conflict between stages, and the flow and distribution of information across stages are key focal points. In many developing countries, information is asymmetrically distributed across stages of a subsector, with larger, well-placed participants at key nodes possessing far superior information to dispersed producers and first handlers, as well as consumers. A last key conduct consideration is how the subsector as a whole responds to changes (exogenous shifts), such as sudden price movements, supply shifts (or new information about supply changes), changed world market conditions, or emerging competitors or competitive threats.

Analysis of conduct at the industry level focuses on a different set of issues:

- Product positioning or placement
- Pricing strategy, including any collusive or predatory pricing practices
- Product promotion, including advertising approaches/campaigns
- Risk management techniques

It is also important to note that conduct is often difficult to observe in commodity subsectors. Firms are reluctant to talk about conduct, and what motivates their behavior, so analysts sometimes have to infer conduct from performance outcomes.

3.3 Performance

In analyzing performance at the subsector level, agricultural economists focus on the following considerations:

- Matching of supply & demand between stages
- Stability of output, prices, profits
- Technical & operational efficiency at each stage & linking stages
- Equity of returns relative to risks, investments
- Accuracy, adequacy, equity of information
- Level & types of employment
- Subsector adaptability, responsiveness

In analyzing industry performance, the focus changes to a different set of attributes:

- Technical & operational efficiency
- Pricing efficiency
- Product characteristics
- Progressiveness (process & product)
- International competitiveness
- Quality, wholesomeness of agricultural products (fresh, processed)

3.4 Relationships among Structure, Conduct and Performance

A lot of the work under APRP, particularly in monitoring public-private market shares, was structural in nature. The assumption was and is that structure affects performance and that a larger private market share would lead to increased competition, more innovation in handling and processing, and lower cost performance of marketing services. Overall, greater numbers of market system participants are assumed to lead to a more efficient marketing system, where there is better coordination between supply and demand between subsector stages.

Some industries, however, have significant capital requirements, which constitute a barrier to entry. Ginning and spinning require much larger investments, and typically operate on much thinner margins, than seed cotton trading or exporting, where overhead costs are low. There are very few investors in Egypt willing to sink large sums of capital into new ginning or spinning enterprises (start-ups) or in taking public companies private when there is excess capacity in both industries. The high capital requirements of some agro-industries necessarily limit the numbers of participants, which is not necessarily a bad thing.

The key is to achieve workable competition, where there are enough participants to ensure competition and prevent collusion, and where competitors strive to innovate technologically, organizationally and managerially. Excessive investment and hyper-competition, as in the private rice milling industry, can lead to excess, under-utilized industry capacity, closures of some mills, and misallocated resources (too much get-on-the-band wagon types of investment).

Conduct is the hardest part of structure, conduct, performance to observe. Anything other than competitive behavior or conduct among firms can lead to undesirable performance outcomes. Industrial organization economists typically pay a lot of attention to any evidence of collusive behavior among firms, anti-competitive pricing (oligopoly pricing or below-cost pricing designed to eliminate weaker competitors), and any administrative allocation of market shares.[5] Firms that collude tend not to invest in improved technology, physical plant and materials, better organization, and strengthened management. Competitive conduct or behavior is characterized by active search for the lowest-cost, best-quality sources of supply, use of improved handling, processing, storage and transport techniques, access to good market information and an ability to use this information quickly, decisively and to good

[5] Administrative allocation does not refer to governmental allocation of market shares here. Rather, it means that market shares are not determined through the competitive behavior of firms, but rather through collusive market-sharing agreements of firms that decide not to compete.

economic advantage, and a search for ways to distinguish or differentiate product through better placement, packaging, presentation and, in some cases, advertising.

Attributes against which performance is measured typically focus on a limited set, which may vary slightly from one subsector to the next, depending on which factors receive the most emphasis:

- Allocative, operational, and technical efficiency
- Stability of output, prices and profits
- Accuracy and adequacy of information, and the extent to which it is distributed widely and in a timely manner
- Level and types of employment
- Evidence of waste or spoilage (e.g., post-harvest losses)
- Subsector adaptability and ability to cope with change and (exogenous) shocks

Ultimately, a key emphasis of subsector studies is on how well coordinated particular commodity markets are. Better market coordination leads to better matching of supply and demand between subsector stages, resulting in efficient, low-cost exchange, maintenance of product quality (minimal spoilage, losses), productive transformation (processing, packaging) that adds value, convenience, quality and other attributes, and overall good information on supplies and prices (at different levels of the marketing system).

4. ILLUSTRATING THE DIFFERENCE BETWEEN CONVENTIONAL IMPACT ASSESSMENT AND SUBSECTOR ANALYSIS

The policy example of reducing or eliminating a tariff on rice is used to illustrate the different emphases of these two approaches. Neither approach is "better" or "more correct;" rather, they focus on different issues and actually complement each other.

As shown in Exhibit 4, reducing the tariff will lead to a certain effects on rice production and consumption. Reducing the tariff will lower the cost of imported rice and should expand rice imports, unless domestic production is exceptionally high and has led to depressed domestic price levels (the abnormal case). Consumers, particularly lower-income consumers, will buy more (cheaper) imported rice. Their welfare will be increased. The added supply of (imported) rice on the domestic market will tend to depress domestic rice and paddy prices. Farmers will plant less area to paddy and grow less rice. Their gross and net revenue from rice production will decline, and their overall income and welfare will decrease to the extent they shift production, at the margin, to the next best cropping alternative. By changing the cropping pattern, water will be saved.

Subsector analysis looks also at the incentives facing traders, millers, importers and exporters. Lower overall rice production could negatively affect rice exporters, who will find less local rice available for export. But it could have less negative impact than anticipated if the demand for rice in foreign markets is sufficiently segmented or differentiated from domestic demand. Millers will have less paddy to process, with lower domestic production, and hence a contraction in the domestic milling industry is likely.[6] The least efficient mills, probably the least competitive commercial mills, will exit the industry.[7] Other, more efficient mills could also operate at a lower rate of their capacity utilization, leading to lower gross and net incomes, layoffs of workers, a halt on investment, and perhaps, at the margin, a shift of some resources to other types of milling or agribusiness processing. First assemblers of paddy and wholesale traders would buy less paddy, as a lower proportion of the crop would be commercialized, and their incomes would decline unless they could use their financial and physical resources to buy and sell other crops. Overall employment in the domestic rice trade would clearly fall.

Subsector analysis does not ignore the possibility that resources can be transferred out of the rice subsector (or into it). Cross-subsectoral impacts must be traced, although subsector analysis does not offer any special tools for quantifying those impacts. It can document changes over time in production, processed throughput, domestic sales and prices, export volume and prices, and employment/investment at different stages of the subsector. Surveys can be designed to capture information on what, for example, rice millers considered the next best alternative investments at the time they invested in rice milling, or to what other uses the land and buildings of a closed down rice mill were put.

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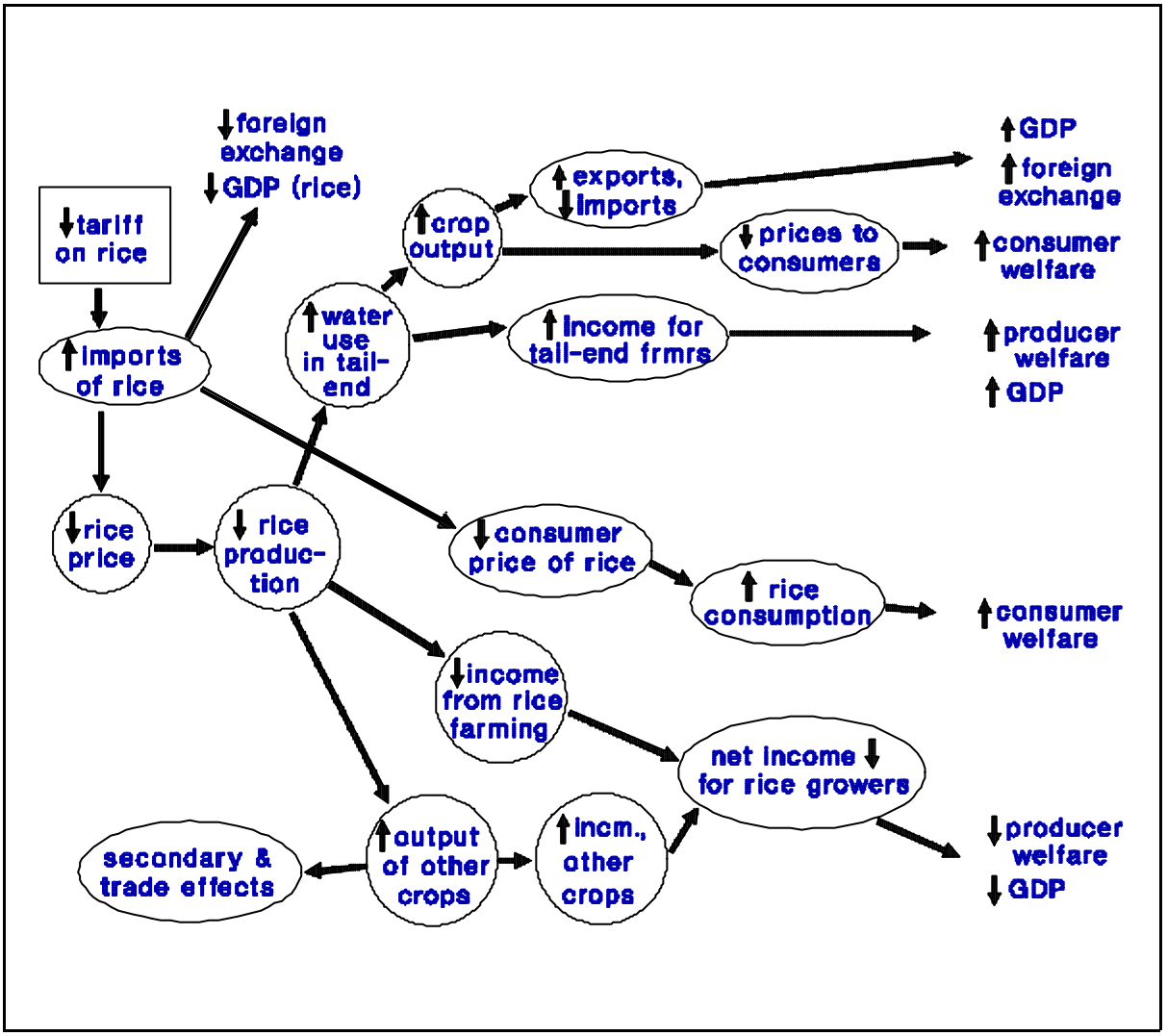
[6] There is already excess capacity in the domestic rice milling industry, so decreased paddy production would certainly lead to closures.

[7] This assumes that the GOE does not try to keep these private mills in business, using subsidies or providing credit, as it has done to the ESA rice milling companies (former public sector rice mills).

Exhibit 4: Welfare Effects of Reducing the Tariff on Rice



5. APPLICATIONS OF SUBSECTOR ANALYSIS TO ECONOMIC IMPACT ASSESSMENT

Subsector analysis has typically been used to do diagnostic assessments of problems and opportunities facing particular commodity subsystems at the beginning of an applied research program or prior to a project or market reform program. It is not usually thought of as an impact assessment method, but it can be adapted for this purpose, especially if the intervention, whether policy, technical, managerial or organizational, is targeted to a particular subsector. This can best be illustrated through the use of several examples.

5.1 Impacts of Privatization

There were ten APRP policy benchmarks that related to privatization: ginning (1); spinning (5); rice milling (4). Rather than concentrating on the impact of privatization benchmarks on producers and consumers, the primary impacts are likely to have been manifested at different stages of the commodity subsectors. Privatization of, say, three public spinning companies, would have the following impacts on *industry* structure, conduct and performance:

- Subsector organization or structure. Public and private sector market shares change, though it is not clear that new private companies would enter this environment. If they do, there will probably be a substantial lag in their entry. By privatizing companies at a key stage of the subsector, a new market channel might be created. As an example, the privatized spinning companies (5) are able to buy lint from the textile holding company or its affiliated cotton trading companies. Their yarn sales are not governed by any holding company committee; they can export yarn (with Textile Consolidation Fund approval) or sell yarn in the domestic market.

- Subsector behavior or conduct. The newly privatized spinners would likely buy more input (lint) from private cotton traders than from public sector traders. The exchange arrangements between private traders and privatized spinners might be quite different than the administrative allocation of lint by the HC (through its affiliates) to public spinners. The privatized spinners might pay higher prices for their lint (as lint sold by the HC and its affiliates to public companies has been subsidized in some years), as well as buy higher grades. A privatized spinner, in attempting to diversify its sources of supply, find lower cost sources of lint, and to reduce the risk of depending on the HC, would be more likely to import lint as well.[8]

- Subsector performance. A privatized spinner would be forced to become more technically and operationally efficient to compete with other spinners in the domestic and world markets. To

[8] Note that only one quasi-public, quasi-private company, Misr Amriya Spinning and Weaving, has imported lint on its own. In the past, the Holding Company was the only importer of lint and remains the principal importer. In 2001/02, the Holding Company imported no lint, but private traders imported significant quantities from Sudan and (to a much lesser extent) Syria.

compete in export markets, they would probably concentrate on spinning higher counts of yarn, where Egyptian spinners can compete and make money (public spinners usually under-spin Egyptian lint). Employment at the privatized spinning company would likely decline to reduce redundancy and to bring labor costs in line with international standards. A privatized spinner, given its increasing efficiency, would likely be able to offer yarn for export at prices lower than the TCF minimum yarn prices that public sector spinners have to observe. This would enable the privatized spinner to increase its market share (in international markets, under quota arrangements for the U.S. and EU markets) at the expense of public spinners.

5.2 Phasing out of Administered Distribution and Pricing Systems

Phasing out of quota allocations and administered pricing at different stages of the cotton/textile subsector is another important set of policy reforms that have had potential to change *subsector* structure, conduct and performance in some of the following ways:

- Subsector organization or structure. With the removal of quotas, private spinners would have easier access to lint sold by public sector companies, who buy at least two-thirds of the seed cotton crop. New entry could be encouraged. The private sector market channel would be strengthened, as private traders could sell to all types of spinners—public, private (including privatized), and joint investment companies. The types of exchange arrangements across stages would be diversified, as buyers and sellers might adopt contracts, auctions, or perhaps even electronic exchanges in addition to spot markets.

- Subsector conduct or behavior. Instead of waiting for the Holding Company or GOE committees to make decisions about seed/lint cotton allocation, public and private firms would compete more vigorously for market share. Grades would likely become better defined, with inter-grade price differentials varying, depending on supply and demand for different grades, rather than the current fixed price differentials between grades. The abandonment of HC or committee decisions would also probably encourage lint imports, as public spinners would be forced to seek out the cheapest source of raw material in order to be competitive.

- Subsector performance. Dropping of administrative allocation of credit, raw material and market shares would most likely lead to a shrinking of public sector participation in seed cotton trading, lint export, and spinning. Capacity would shrink in several cotton/textile subsector industries, but the stronger private, privatized, joint investment and public companies would survive and be able to operate more profitably, have better access to credit (less crowding out), and could obtain raw material more easily, particularly in years of scarce domestic supply. Coupled with a change in the administrative allocation of varieties in planting (the variety map), doing away with all quotas and administered market shares would probably lead to a shift in varieties grown to lower-quality LS varieties (Gizas 80/83), and perhaps some medium staple varieties, to meet the needs to the domestic spinning industry.

6. CONCLUSION

Subsector analysis is well-suited to analyzing changes in the structure, conduct, and performance of key commodity subsystems in Egyptian agriculture over the APRP policy reform period. Many policy benchmarks were targeted to specific changes in key subsystems that employ many people in production, marketing, processing, and distribution activities. Much of the emphasis of APRP, as opposed to APCP, was in removing impediments in downstream marketing, processing and export stages of key commodity subsectors. APCP concentrated more on constraints facing farmers in input and product markets, whereas APRP moved beyond the farm to work with different groups of participants in the agribusiness system.

Both the baseline subsector studies and the endline studies use subsector analysis and an implicit, underlying structure, conduct, and performance approach. The endline studies examine, among other things, the structural changes, different behavior of firms and industries, and the performance consequences of structural and behavioral changes on four commodity subsystems. Some attempt will be made to attribute changes and outcomes to APRP, as opposed to general economic developments, non-APRP related actions of the GOE, and other exogenous factors.

An ultimate objective of APRP's subsector studies has been to understand how agribusiness firms and industries respond to policy reform and the changes that market liberalization lead to in behavior and performance in commodity subsectors. Agribusiness firms play an important market coordinating role, linking producers and consumers (the usual focal points of economic impact assessment). The MVE Unit is confident that the four sets of subsector studies provide a comprehensive and useful picture of policy reform and its impacts in important components of the Egyptian agribusiness system.

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